

## REMARKS

Applicants appreciate the continued thorough and detailed examination of the present application that is reflected in the second, non-final Official Action of April 7, 2004. Applicants also appreciate the Examiner's indication that all of the earlier rejections have been withdrawn. Notwithstanding the detailed Official Action and new grounds of rejection, Applicants respectfully request reconsideration of the pending claims as being obvious over the NIST Chemistry WebBook ("NIST") taken alone or in combination with the Ruger Chemical Webpage ("Ruger Chemical"). A detailed claim analysis will be provided below.

To summarize, NIST is a Website that provides thermochemical, thermophysical and ion energetics data compiled by NIST under the Standard Reference Data Program, whereas embodiments of the present invention relate to chemical reaction management systems, methods and computer program products. Moreover, consistent with the overall objective of NIST, the section of NIST that allows searching by "reaction" provides thermodynamic data concerning chemical reactions, but does not describe or suggest chemical synthesis. Furthermore, the section of NIST that allows searching by reaction is simply not prior art, as it appears to have been implemented in 2003. Finally, the Ruger Chemical website allows a user to purchase equipment or chemicals by sending an email, but does not allow automatic purchasing of equipment and chemicals for chemical synthesis.

Accordingly, it would not be obvious to provide Applicants' *"Systems, Methods And Computer Program Products For Determining Parameters For Chemical Synthesis And For Supplying The Reagent, Equipment And/Or Chemicals Synthesized Thereby"* (see the title of the present application) in view of NIST's "Standard Reference Database" or Ruger Chemical's email purchasing. Applicants, therefore, respectfully request withdrawal of the outstanding rejections and allowance of the present application.

### **The Pending Claims Are Patentable Over NIST**

As noted above, the present application relates to *"Systems, Methods and Computer Program Products for Determining Parameters for Chemical Synthesis and for Supplying the Reagent, Equipment and/or Chemicals Synthesized Thereby"*. See the

title of the present application. As noted in the Background of the Invention section of the present application:

Chemicals are synthesized for various applications in commercial and academic environments. In chemical synthesis, a plurality of reagent chemicals are used to synthesize a target chemical, by reacting the reagent chemicals in predefined equipment according to a predefined procedure. The reagent chemicals, the target chemical, the equipment and the procedure provide the parameters for chemical synthesis.

More specifically, the pending claims relate to systems, methods and computer program products for "determining parameters for chemical synthesis" (Claims 1-11, 24-34 and 44-54), or systems, methods and/or computer program products for "obtaining materials for chemical synthesis" (Claims 18-20, 41-43 and 61-63). As defined in the present application in the section quoted above, chemical synthesis relates to chemical reactions. Moreover, as defined by Webster's Third New International Dictionary, 1986, a reaction is a "chemical transformation or change: the reversible or irreversible interaction of molecules, atoms, ions or radicals to form one or more new substances".

In sharp contrast, the NIST Chemistry WebBook "provides thermochemical, thermophysical and ion energetics data compiled by NIST under the Standard Reference Data Program", as noted at the top of Page 2 of NIST that was cited by the Examiner. As is well known, NIST is a standards organization, and the NIST Chemistry WebBook is designed to provide a repository for physical property information about substances. Thus, looking at the first page of the NIST Chemistry WebBook cited by the Examiner, the various search options allow searching by formula, name, CAS registry number, author and structure, and allows searches based on the following physical properties: ion energetics properties, vibrational and electronic energies, and molecular weight. The "Special Data Sets" described at the middle of Page 1, as cited by the Examiner, also provides "Thermophysical Properties of Fluid Systems High accuracy data for a select group of fluids".

Similarly, Page 3 of NIST, as cited by the Examiner, allows for a "Search for Species Data by Chemical Formula". As noted therein, a desired chemical formula may be used with various options. The following Thermodynamic Data may be searched: gas phase, condensed phase, phase change, reaction, ion energetics and ion cluster. The following Other Data can be searched: gas phase IR spectrum, mass

spectrum, UV/Vis spectrum, vibration and/or other electronic spectrum, constants of Diatomic Molecules, and Henry's Law. Accordingly, all of this data relates to properties of a chemical, not synthesis of a chemical.

Applicants also note that one type of "thermodynamic data" specified on Page 3 of NIST, as cited by the Examiner, is "reaction" data. However, clicking on the reaction data provides the Webpage attached hereto as Appendix A, under "Reaction Search". As shown in Appendix A, thermodynamic data of various reactions is provided for these searches. Stated differently, the reaction search provides physiochemical data that is a property of the substance, such as how much heat or energy is needed to make that particular substance disassociate or become energetic enough to react. The reaction data is not the synthesis procedure that is used to make the material but, rather, what type and amount of energy can affect that particular substance.

Finally, the "reaction" data of NIST is simply not prior art for the present application. More specifically, the Examiner is invited to select the link, <http://webbook.nist.gov/chemistry/history.html>, which provides the NIST version history, as printed out in Appendix B, attached hereto. This version history shows, at Page 1 of 4, that reaction thermodynamic data was available in February 1997. However, Page 4 of 4 indicates that the reaction search option was added in March 2003! This is well after the filing date of the present application. Accordingly, the reaction search option is simply not prior art to the present application.

#### **The Pending Claims Are Patentable Over Ruger Chemical In View of NIST**

As will be described in detail below, some of the claims relate to electronically ordering target chemicals, reagent chemicals and/or equipment. The newly cited Ruger Chemical Website states at Page 1 that Ruger Chemical includes a complete line of emulsifiers, waxes, preservatives, etc. However, these items cannot be electronically ordered, as the listing at Page 1 of Ruger Chemical does not provide links that enable selection of these materials. Stated differently, one cannot click on this listing. Moreover, the only provision for ordering is by sending an email to [purchasing@rugerchemical.com](mailto:purchasing@rugerchemical.com). Accordingly, electronic ordering as recited in the claims is not described or suggested by Ruger Chemical.

A detailed traversal of the rejection of pending Claims 1-11, 18-20, 24-54 and 61-63 now will be provided. For the convenience of the Examiner, this traversal will be presented in the order in which the claims were rejected in Paragraphs 3 and 4 at Pages 2-7 of the Official Action of April 7, 2004. Moreover, for the sake of brevity, only the method claims will be analyzed. However, analogous reasons apply equally to the system and computer program product claims.

**Claims 1, 24 and 44 Are Patentable Over NIST**

Claim 1 recites:

1. A computerized method of determining parameters for chemical synthesis comprising:  
accepting a user identification of a target chemical; and  
displaying a listing of reagent chemicals that are used to synthesize the target chemical, a listing of equipment that is used to synthesize the target chemical and a listing of a procedure that is used to synthesize the target chemical by reacting the reagent chemicals in the equipment according to the procedure, in response to the user identification of the target chemical.  
(Emphasis added.)

Accordingly, Claim 1 clearly recites a method for reaction management which, in response to a user identification of a target chemical, displays a listing of reagent chemicals that are used to synthesize the target chemical, a listing of equipment that is used to synthesize the target chemical and a listing of the procedure that is used to synthesize the target chemical by reacting the reagent chemicals in the equipment according to the procedure.

In rejecting Claim 1, the Official Action states that NIST teaches:

Displaying a listing of reagent chemicals (page 6, lines 34-35) that are used to synthesis the target chemical. NIST does not explicitly teaches a listing of equipment that is used to synthesis the target chemical and a listing of a procedure that is used to synthesis the target chemical by reacting the reagent chemicals in the equipment according to the procedure, in response to the user identification of the target chemical. However, on page 6 lines 34-35, NIST displays a links that allow the user to retrieve the method and the equipments to synthesis the compound of the user target chemical (C4H). Therefore, it would have been obvious to one ordinary skill in the art at the time of the invention was made to utilize the links as taught in NIST to allow the retrieval of the procedures and the equipments in order to synthesis the C4H entered by the user.

However, as was already noted, the purpose of the NIST database is to provide "thermochemical, thermophysical and ion energetics data compiled by NIST under the Standard Reference Data Program". NIST is a standards organization, whose job it is to compile data. Accordingly, Page 3 of NIST, as cited by the Examiner, allows the user to search for various types of data (i.e., thermodynamic data and other data). The search may be made by chemical formula, because this is how searches are made for chemicals, and the search at Page 5 of NIST related to  $C_4H$  describes a search by chemical formula. As noted at Page 5 of NIST, the following other data is available for  $C_4H$ : vibration and/or electronic energy levels and gas phase kinetics (on kinetics web site). This data is physical data related to  $C_4H$ , and does not relate to synthesis of  $C_4H$ . Page 6 of the NIST database cited by the Examiner provides the vibrational and/or electronic energy levels for  $C_4H$ . Various energies, wavelengths and references are provided for the data. However, there is nothing contained therein as to a listing of reagent chemicals that are used to synthesize  $C_4H$ , a listing of equipment that is used to synthesize the  $C_4H$ , and a listing of a procedure that is used to synthesize the  $C_4H$  by reacting the reagent chemicals in the equipment according to the procedure, as recited in Claim 1.

Page 6 of NIST does not describe or suggest any links that are available to allow the user to retrieve the procedure and the equipment to synthesize  $C_4H$ . Rather, Page 6 describes physical properties (e.g., vibrational and/or electronic energy levels) of  $C_4H$ . As was also described above, any reference to reaction thermodynamic data at Page 3 of NIST relates to thermodynamic data for a reaction, as shown in Appendix A, and is also simply not prior art, as it was added to NIST in 2003, whereas the present application was filed on January 29, 2001. ✓

Accordingly, Applicants respectfully submit that NIST does not describe or suggest "a listing of reagent chemicals that are used to synthesize the target chemical", "a listing of equipment that is used to synthesize target chemical" or "a listing of a procedure that is used to synthesize the target chemical by reacting the reagent chemicals in the equipment according to the procedure", as recited in Claim 1. In fact, the data in NIST is, by NIST's definition, "thermochemical, thermophysical and ion energetics data" for various chemicals, and any reaction searching mentioned in NIST is for thermodynamic reaction data and is not even prior art. Accordingly, NIST does

not describe reagent chemicals, equipment that is used to synthesize the target chemical or a procedure for a chemical reaction. Moreover, since NIST is concerned with thermochemical, thermophysical and ion energetics data for chemicals, it would not be obvious to modify NIST to provide a reaction management method. Accordingly, Applicants respectfully request withdrawal of the outstanding rejections of Claims 1, 24 and 44, and of the dependent claims that depend therefrom.

**Claims 3, 26 and 36 Are Independently Patentable**

Claim 3 recites:

3. A method according to Claim 1 wherein the accepting a user identification of a target chemical is preceded by:  
entering into a database, a plurality of target chemicals, a plurality of corresponding listings of reagent chemicals that are used to synthesize the plurality of target chemicals, a plurality of corresponding listings of equipment that is used to synthesize the plurality of target chemicals and a plurality of corresponding listings of procedures that are used to synthesize the plurality of target chemicals by reacting the corresponding reagent chemicals in the corresponding equipment according to the corresponding procedure.

In rejecting Claim 3, the Official Action states that NIST teaches the recitations of Claim 3, citing "col. 25, lines 20-30". Applicants note that NIST does not have columns, and there is no Page 25. Moreover, as was already described, since NIST describes "thermochemical, thermophysical and ion energetics data", there is no description or suggestion to enter into NIST a plurality of target chemicals, a plurality of corresponding listings of reagent chemicals, and a plurality of corresponding listings of equipment, and a plurality of corresponding procedures, as recited in Claim 3. Accordingly, these claims are independently patentable for at least these additional reasons.

**Claims 5, 28 and 48, and 6, 29 and 49 Are Independently Patentable**

These claims are patentable at least per the patentability of the independent claims from which they depend.

**Claims 7, 30 and 50 Are Independently Patentable**

Claim 7 recites:

7. A method according to Claim 1 wherein the accepting a user identification of a target chemical comprises:  
accepting a user identification of a reaction type;  
displaying a listing of target chemicals that are synthesized using the reaction type; and  
accepting a user selection of a target chemical from the listing of target chemicals that are synthesized using the reaction type.

Accordingly, Claim 7 recites searching by reaction type. In rejecting these claims, the Official Action cites Page 10 of NIST. However, Page 10 of NIST provides search results for matches to a chemical formula, not a reaction type. Moreover, as already noted above, the "reaction search" of NIST allows a search based on reaction thermodynamic data, and was not provided until 2003. For at least these additional reasons, Claims 7, 30 and 50 are independently patentable.

**Claims 8, 31 and 51 Are Independently Patentable**

Claim 8 recites:

8. A method according to Claim 1 wherein the following is performed between the accepting and the displaying:  
displaying a listing of procedures that can be used to synthesize the target chemical; and  
accepting a user selection of a procedure from the listing of procedures that can be used to synthesize the target chemical.

Accordingly, Claim 8 relates to searching by procedures. The Official Action at Page 4 cites "col. 40, lines 63-65" in rejecting these claims. However, NIST does not have columns and, as was already described, there is no provision in NIST for displaying procedures that can be used to synthesize a target chemical, and allowing a user to select a procedure. This is not surprising, since NIST relates to chemical data rather than reaction management. Accordingly, for at least these additional reasons, these claims are independently patentable.

**Claims 9, 32 and 52 Are Independently Patentable**

Claim 9 recites:

9. A method according to Claim 1 wherein the following is performed between the accepting and the displaying:

accepting a user selection of a desired quantity of the target chemical;  
and  
scaling the listing of the reagent chemicals so as to synthesize the desired quantity of the target chemical; and  
wherein the displaying comprises:  
displaying a scaled listing of the reagent chemicals that are used to synthesize the desired quantity of the target chemical, a listing of equipment that is used to synthesize the desired quantity of the target chemical and a listing of a procedure that is used to synthesize the desired quantity of the target chemical by reacting the reagent chemicals in the equipment according to the procedure, in response to the user identification of the target chemical and the user selection of the desired quantity of the target chemical.

Accordingly, this claim relates to scaling the reagent chemicals and the listing of equipment in response to user selection of the desired quantity of the target chemical. In rejecting these claims, the Official Action cites Pages 3 and 4 of NIST. However, as was already described, Pages 3 and 4 allow searches to be made by chemical formula to obtain data, but there is no description of scaling. This is not surprising because, in a chemical data system, scaling would not appear to be a relevant concept.

#### **Claims 10, 38 and 63 Are Independently Patentable**

Claim 10 recites:

10. A method according to Claim 1 wherein the accepting a user identification of a target chemical comprises:  
displaying a prioritized listing of target chemicals that match the user query; and  
accepting a user selection of a target chemical from the prioritized listing of target chemicals that match the user query.

As noted in the present application, for example at Page 19, lines 5-13:

When multiple results are found, a prioritized listing may be displayed, so that more likely desired results are displayed at the top of the listing. In particular, in response to a user input in field **1810** of Figure 18, the name, other\_names and info attributes of the chemical database **216a** may be searched. The results may be displayed in a priority sequence as follows: exact matches in the name attribute; exact matches in the other\_names attribute; partial matches in the name attribute; and, finally, partial matches in the other\_names attribute. By prioritizing the display of results, the more likely user selections may be displayed at the top of the list in Figure 19.

In rejecting Claims 10, 38 and 63, the Official Action cites the same passages that were used in rejecting in Claims 7, 8 and 9. These passages clearly do not describe a



prioritized listing of chemicals. Accordingly, these claims are independently patentable for at least these additional reasons.

**Claims 11, 39 and 64 Are Independently Patentable**

Claim 11 recites:

11. A method according to Claim 1 wherein the accepting a user identification of a target chemical comprises:  
accepting user identification of a chemical;  
displaying a listing of procedures that use the chemical as a reagent chemical; and  
accepting a user selection of a procedure from the listing of procedures that use the chemical as a reagent chemical.

In rejecting Claim 11, the Examiner cites the same passages that were used with respect to Claims 7, 8, 9 and 10. However, these passages do not describe or suggest searching by procedures, as recited in Claim 11. This is not surprising, since synthesis procedures are not described by NIST. Accordingly, these claims are independently patentable for at least these additional reasons.

**Claims 18, 41 and 61 Are Patentable Over Ruger Chemical In View of NIST**

Claim 18 recites:

18. A computerized method of obtaining materials for chemical synthesis comprising:  
electronically ordering a target chemical, reagent chemicals that are used to synthesize the target chemical and/or equipment that is used to synthesize the target chemical, from an electronically displayed listing of the reagent chemicals that are used to synthesize the target chemical, of the equipment that is used to synthesize the target chemical and of a procedure that is used to synthesize the target chemical by reacting the reagent chemicals in the equipment according to the procedure, in response to user input to order the target chemical, the reagent chemicals that are used to synthesize the target chemical and/or the equipment that is used to synthesize the target chemical.

As was already noted above, Ruger Chemical does not describe electronically ordering a target chemical, reagent chemicals and/or equipment from an electronically displayed listing of the reagent chemicals, the equipment and the procedure, as recited in Claim 18. Rather, Ruger Chemical lists, at Page 2, "emulsifiers, waxes, preservatives, white oils & petrolatums, emollients, humectants, parabens, pharmaceutical chemicals, sorbitol/manitol, cosmetic chemicals, glycerine, plus many more". As was noted

above, this listing is not electronically accessible, because this listing does not provide any links. Moreover, the only links provided on this page relate to sending an email to "Purchasing". The sending of an email to Purchasing does not describe or suggest electronically ordering, as recited in Claim 18. Moreover, as was already described, NIST does not teach any aspects of chemical synthesis.

Applicants also wish to note that, in rejecting Claim 18, the Official Action states at Page 6:

...On the other hand, NIST teaches, the target chemical can be retrieved and displayed the chemical reaction (page 10), chemical structure (page 10) and elements that makeup the chemical (page 10) and method and equipment that synthesis the chemical obtained by link LF (page 6, lines 34-45)....

As was already described, a target chemical may be searched for its thermochemical, thermophysical and ion energetics data using NIST, but not as to its synthesis. Its chemical structure can also be displayed, but not its chemical synthesis. Moreover, "link LF" at Page 6 merely describes that the method used for measuring the vibrational energy level is using "Laser-excited fluorescence (excitation and resolved emission)" as noted at Page 12 of NIST. This is not a synthesis method but, rather, describes a method that was used in obtaining the vibrational energy level data for C<sub>4</sub>H. Accordingly, the combination of Ruger Chemical and NIST would not describe or suggest the recitations of Claim 18, 41 and 61. For at least these reasons, Claims 18, 41 and 61 are patentable over Ruger Chemical in view of NIST.

#### **Claims 19, 42 and 62 Are Independently Patentable**

Claim 19 recites:

19. A method according to Claim 18 wherein the electronically ordering comprises:  
electronically ordering a kit of the reagent chemicals that are used to synthesize the target chemical.

In rejecting these claims, the Official Action cites Page 2 of Ruger Chemical. However, as was already described, the only electronic ordering at Page 2 of Ruger is the provision to send an email to Purchasing. There is no provision for electronically ordering any of the listed materials and there is no provision for ordering a kit of any of these materials. Accordingly, these claims are independently patentable for at least these additional reasons.

**Claims 20, 43 and 63 Are Independently Patentable**

Claim 20 recites:

20. A method according to Claim 18 wherein the electronically ordering comprises:  
electronically ordering a kit of the equipment that is used to synthesize the target chemical.

The Official Action cites the same passage that was cited in rejecting Claim 19.

However, this passage does not contain any description or suggestion of ordering a kit of equipment that is used to synthesize the target chemical, because synthesis is simply not described or suggested by NIST or Ruger Chemical. Accordingly, these claims are independently patentable for at least these additional reasons.

**Claims 2, 4, 25, 27, 45 and 47 Are Independently Patentable**

Claim 2 recites:

2. A method according to Claim 1 further comprising:  
accepting user input to order the target chemical, the reagent chemicals that are used to synthesize the target chemical and/or the equipment that is used to synthesize the target chemical; and  
electronically ordering the target chemical, the reagent chemicals that are used to synthesize the target chemical and/or the equipment that is used to synthesize the target chemical, in response to the user input to order the target chemical, the reagent chemicals that are used to synthesize the target chemical and/or the equipment that is used to synthesize the target chemical.

In rejecting these claims, the Official Action states that they are rejected for the same reasons as Claim 18. The Official Action also states, at Page 7:

...in addition, Ruger chemical also allow the user to input the chemical from the menu list or user can input into the electronic ordering (page 2).

However, as was already described, there is no provision at Page 2 of the Ruger Chemical website to input the chemical from the menu list. There is certainly no provision that provides the recitations of Claim 2. Accordingly, Claims 2, 4, 25, 27, 45 and 47 are independently patentable for at least these additional reasons.

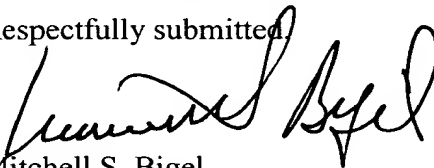
**Conclusion**

Applicants again appreciate the thorough and detailed Official Action and the new citation of NIST and Ruger Chemical. However, Applicants have now shown that

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Filed: January 29, 2001  
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NIST is a website for thermochemical, thermophysical and ion energetics data compiled by NIST under the Standard Reference Data Program, whereas the claimed invention relates to chemical reaction management methods, systems and computer program products. Applicants have also shown that it would not be obvious from NIST to provide listings of reagent chemicals that are used to synthesize a target chemical, equipment that is used to synthesize the target chemical and/or a procedure that is used to synthesize the target chemical by reacting the reagent chemicals in the equipment according to the procedure, as recited in the independent claims. Moreover, the Ruger Chemical website does not describe or suggest electronic ordering as recited in the pending claims. Furthermore, Applicants have shown that many of the dependent claims are separately patentable. Accordingly, Applicants respectfully request withdrawal of the outstanding rejections and allowance of the pending claims.

Respectfully submitted,

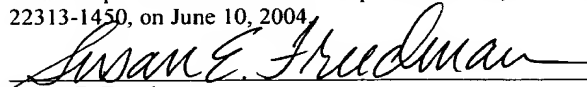


Mitchell S. Bigel  
Registration No. 29,614  
Attorney for Applicants

**Customer Number 20792**  
Myers Bigel Sibley & Sajovec, P.A.  
P.O. Box 37428  
Raleigh, NC 27627  
919-854-1400  
919-854-1401 (Fax)

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